

**Translation**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>D-03004 PCT</b>	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. <b>PCT/DE2004/001414</b>	International filing date (day/month/year) <b>02.07.2004</b>	Priority date (day/month/year) <b>03.07.2003</b>
International Patent Classification (IPC) or national classification and IPC <b>C07C51/41 , C07C57/04, C09D11/10, C08F2/48, A23L3/3436</b>		
Applicant <b>SASOL GERMANY GMBH</b>		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>10</u> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>	
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>	

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/DE2004/001414

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
    - ☐ international search (Rule 12.3 and 23.1(b))
    - ☐ publication of the international application (Rule 12.4)
    - ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
  - ☐ the international application as originally filed/furnished
  - ☒ the description:
 

pages	<u>1, 4-10, 12, 14, 16-27</u>	as originally filed/furnished
pages*	<u>11</u>	received by this Authority on <u>30.05.2005 with letter of 29.03.2005</u>
pages*	<u>2, 2a, 3, 13, 15</u>	received by this Authority on <u>16.09.2005 with telefax</u>
  - ☒ the claims:
 

nos.	_____	as originally filed/furnished
nos.*	_____	as amended (together with any statement) under Article 19
nos.*	<u>1-20</u>	received by this Authority on <u>16.09.2005 with telefax</u>
nos.*	_____	received by this Authority on _____
  - ☐ the drawings:
 

sheets	_____	as originally filed/furnished
sheets*	_____	received by this Authority on _____
sheets*	_____	received by this Authority on _____
  - ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, nos. \_\_\_\_\_
  - ☐ the drawings, sheets/figs \_\_\_\_\_
  - ☐ the sequence listing (*specify*): \_\_\_\_\_
  - ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, nos. \_\_\_\_\_
  - ☐ the drawings, sheets/figs \_\_\_\_\_
  - ☐ the sequence listing (*specify*): \_\_\_\_\_
  - ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims 1-20	YES
	Claims	NO
Inventive step (IS)	Claims 1-20	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-20	YES
	Claims	NO

## 2. Citations and explanations (Rule 70.7)

**D1** US 5 998 646  
**D2** SU 614 089  
**D3** US 3 923 716, cited in the application  
**D4** BE 763 157  
**D5** US 3 337 391  
**D6** US 2 940 957  
**D7** FR 1 205 366  
**D8** JP 63 247 037, Derwent abstract  
**D9** JP 040 08 298  
**D10** US 5 952 151

1. Amendments - PCT Article 34(2) (b)

Claim 1 has been reworded such that it is restricted to the constant supply of oxygen where M = Al, Si, Sn, La, Zr, Cu and/or Zn, the reaction solution being at least 50% oxygen-saturated (new claim 1). The constant supply of oxygen where M = Mg, Ca, Al, Si, Sn, La, Ti, Zr, Cu and/or Zn is supported by the original application (original claim 1 and page 3, lines 34-36). Owing to the disclosures of **D1**, **D5**, **D6** and **D8**, the options M = Mg, Ca and Ti were deleted from claim 1. The obvious error in claim 3 "alcohol-" instead of "alcoholate-group" has been

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corrected (PCT Rule 91.1). Examples 6 and 7, where  $M = \text{Ti}$  and  $\text{Mg}$ , which now no longer fall under the scope of protection sought, are characterised as comparative examples. The description has been brought into line with the new set of claims. **D1** is mentioned on page 2 (PCT Rule 5.1(a)(ii)). The criteria of PCT Article 34(2)(b) are therefore met.

## 2. Novelty - PCT Article 33(2)

**D2** describes acrylic acid  $\text{Li}$  salt; **D4**  $\text{C}_{11}\text{H}_{19}\text{O}_2\text{Li}$  salt, and **D7** sorbinic acid  $\text{Na}$  salt. These carboxylic acid metal salts differ from the formula  $\text{C}_n\text{H}_{2n-1}\text{COOM}$  in that  $M = \text{Li}$  or  $\text{Na}$ ,  $n > 6$ , or in that there is more than one double bond present. Acrylic acid  $\text{Al}$  salt from **D3** is no longer produced by the reaction of aluminium alcoholate.

Uses of acrylic acid metal salts in coatings, printing ink compositions, pharmaceuticals or fungicides are known from **D1**, **D5-D6**, and **D8-D10**.

Carboxylic acid **Ti** salt of the formula  $(\text{C}_n\text{H}_{2n-1}\text{COO})\text{M}_a(\text{R}^1)$  and/or based on maleic acid are known from the prior art (**D1**, **D5**, **D6**). Production by the reaction of metal alcoholate or  $\text{M}(\text{R}^1)_c$  with corresponding carboxylic acids is also already disclosed in these documents (**D1**, **D5** and **D6**). No inert reaction conditions are disclosed in **D1** and **D6**. The absence of oxygen in these documents cannot therefore be excluded. Oxygen saturation is not mentioned in these documents.

Novelty can therefore be acknowledged for the subjects of

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

claims 1-20.

### 3. Inventive step - PCT Article 33(3)

**D1** is considered the closest prior art. The carboxylic acid metal salts from **D1** differ in that they are Ti salts (not contained in claim 1). The problem addressed by the present application is that of providing a method in which pure carboxylic acid metal salts of different metal ions can be more easily produced (fewer and simpler reaction steps; more easily separable and fewer side products) and undesired polymer compounds are avoided. The solution is the method as per claim 1, i.e. the reaction of carboxylic acid of the formula  $C_nH_{2n-1}COOH$  and/or maleic acid with metal alcoholate or  $M(R^1)_c$ , where  $n = 2-6$ , with a double bond in the 2 or 3 position and  $M = Al, Si, Sn, La, Zr, Cu$  and/or  $Zn$ , with a constant supply of oxygen, such that the reaction solution is at least 50% oxygen-saturated.

Example 1 uses aluminium-tri-*sec*-butanolate and acrylic acid in the presence of polymerisation-inhibiting substances. It was carried out with nitrogen capping (page 11, line 12). The polymerised product is formed. The further examples 2-10 are carried out in the presence of oxygen. No formation of polymers is identified. The proposed solution therefore solves the present technical problem. Example 6 of the application relates to the method where  $M = Ti$ , with a constant supply of oxygen up to 15-30 vol.%. Example 7 uses  $M = Mg$ , whilst examples 2-5 use  $Al$  or  $Zr$  as the metal. This method is therefore carried out with the same technical effects independently

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of M. The production of the polymerised products is therefore only avoided by the oxygen saturation of the reaction solution. The reaction is carried out in **D1** under exclusion of the atmosphere. Since no details are given in **D1** as to the oxygen saturation and the consequences thereof for polymerised compounds, the proposed solution is non-obvious. The subject matter of claim 1 and of dependent claims 2-20 therefore involves an inventive step.

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The expressions "preferably" and "in particular" are unclear, since they do not bring about any restriction in the scope of protection sought by the claim. The feature that follows these expressions is considered entirely optional (PCT Guidelines II-5.40). If this is not intended to be the case, each of these features should be reworded as an independent claim.